

becoming obliterated." At Mr. Jeffs's suggestion, a Committee of the British Association was appointed at the Bath meeting, charged with the duty of obtaining geological photographs, which were to be duly preserved, catalogued, dated and described. The Committee commenced its labours by inviting contributions from all British geologists, and its appeal met with a most generous response. Photographs at once began to flow in, and have continued to do so ever since, so that a vast mass of valuable material is now accumulated in the Museum of Geology, Jermyn Street, which was selected as the home of the collection.

The usefulness of the collection has now been largely increased by the action of the Committee in resolving to publish a selected number of its best photographs, and geologists are greatly indebted to the secretary of the Committee, Prof. W. W. Watts, for the admirable manner in which he has carried this resolution into effect. The success of his efforts is witnessed by the first issue, now before us. It comprises twenty-two photographs, contained in a neat portfolio case; each is accompanied by descriptive letterpress, the date when it was taken and the name of the photographer. The descriptions are terse and to the point, as might be expected when it is added that they are all contributed by well-known geologists; among others, we notice the names of Sir Archibald Geikie, Prof. Bonney, Mr. J. E. Marr and Prof. Watts himself. To show how thoughtfully even smaller matters have been attended to, we may point out that a duplicate copy of the letterpress is provided, printed on one side of the paper only and gummed on the other, so that when mounted each photograph may bear its own description secured to it. Further, in addition to the paper prints, which are platinotype and therefore permanent, there is another

sion of their photographers, we select for reproduction on a reduced scale, are no better or worse than the remainder of the series.

The issue is the first of three, the second of which may be expected to appear before the end of the current



FIG. 2.—Widened joints ("grikes") and rain-gullies in Carboniferous Limestone; Hampsfell, near Grange, Lancashire. Photographed by Mr. Godfrey Bingley. The top of Hampsfell, near Grange, presents a weird and desolate aspect. There is no soil, the surface being barren limestone, whereupon but a few stunted bushes contrive to grow. Chemical denudation is at work, every joint and small crack in the limestone is widened, and its edges smoothed off by the solvent action of "carbonated water." The limestone is so pure that little argillaceous matter is left, after solution, to support vegetation, so that instead of the usual soil and grass-covered surface we have an arid corrugated waste, more resembling in appearance the "frozen fury" of a cooled lava-flow than the gentle undulating outlines we are accustomed to associate with weathered surfaces of stratified rocks in these islands. A. S. REID.



FIG. 1.—Carboniferous Limestone resting unconformably on Ludlow Slates; Arco Wood Quarry, west side of Ribblesdale, about four miles north of Settle, Yorkshire. Photographed by Prof. S. H. Reynolds, 1889. The horizontal beds at the base of the Mountain Limestone here rest unconformably on the upturned and denuded edges of the Ludlow Slates. The latter formed a plane of marine denudation which quickly subsided, causing the absence of mechanical sediments. The district furnishes evidence that many thousands of feet of Lower Palaeozoic rock were denuded before the deposition of the Carboniferous strata. An inconstant conglomerate, a few feet in thickness, with pebbles of Lower Palaeozoic rock in a calcareous matrix, is found in places, but it is absent in the section photographed. The Ludlow beds are seen dipping south at a very high angle. A marked bedding-plane is seen at the south (left) end of the photograph (above the initials S.H.R.). The more prominent planes visible in the photograph, traversing the slates, are cleavage planes, inclined to the north at an angle higher than that of the bedding. The straight face of the limestone is due to dominant joints. The cliff, from the base of the quarry to the sky line, is many scores of feet in height. JOHN E. MARR.

issue in the form of lantern slides, which should prove of great value in the lecture room.

Where all are excellent it is difficult to choose, and the accompanying photographs, which, with the kind permis-

year. The price of these photographs is so small that they are sure to be much used in museums, colleges and schools for teaching purposes. The subscription list is nominally closed, but we understand that subscribers will still be admitted on the original terms until the end of November.

In congratulating the Committee of the British Association and its secretary on this admirable piece of work, the hope may be expressed that now the way has been shown, foreign societies, if they have not already done so, may follow suit; the subject is one that might well be brought before the notice of the International Geological Congress at its meeting next year in Vienna.

THE CRUISE OF THE "GAUSS" FROM CAPE TOWN TO KERGUELEN.

THE second part of the joint publication of the Berlin Institutes for Oceanography and Geography contains the official report of the work of the German Antarctic expedition on board the *Gauss* on its outward voyage from Cape Town to Kerguelen. The stay in Cape Town was prolonged in order to caulk the ship, which was leaking considerably though not to a dangerous degree, and to make certain changes in the gear and fittings which experience showed to be desirable. Six members of the crew were landed at their own request or as undesirables, and substitutes for them had to be found, and at the last moment two Norwegian volunteers were also taken on board. Prof. Drygalski acknowledges very warmly the hearty reception given him by the authorities at the Cape, which culminated in a military band playing German airs at the pierhead as the *Gauss* took her departure on November 27, 1901.

A course was set for Kerguelen, and the scientific work *en route* was reduced so as not to cause undue delay; still, the opportunity was taken to make thirteen deep-sea

soundings along a track where none existed before. Eleven of these were more than 1000 fathoms, five were more than 2000 fathoms, and the deepest was 2830 fathoms, in 42° 30' S., 33° 45' E. The weather was unfavourable with occasional calms, frequent head winds and almost always a very heavy sea rendered the ship extremely uncomfortable. The most interesting episode on the way was a landing which was successfully made on Possession Island of the Crozet group on Christmas Day. Possession Island and East Island came in sight at 5 a.m., the latter thickly veiled in fog, which gradually cleared. The landing was made in one of the numerous small bays of the north-west coast of Possession Island, where the party stepped ashore on a low basalt rock into an idyllic beast-world of slumbering sea-elephants, penguins drawn up in lines of military precision, and sea-birds fluttering curiously close overhead. The coast of the island as a whole was diversified with off-lying rocks and deeply cut caverns, the variety being due to the contrast of the alternate horizontal sheets of hard basalt and soft volcanic agglomerate. Moss grew luxuriantly, and above the cliffs the gentle slopes were in some places covered with marshy vegetation so deeply as to require the greatest care in crossing them. The sea-elephants and penguins furnished a supply of fresh meat which seems to have been appreciated on board; but the Kerguelen cabbage (which seems to have been nearly extirpated by rabbits in Kerguelen itself) was found bitter and unpleasant.

There was no trace of glaciation on the island. A puzzling appearance was presented by the loose material covering the slopes of one of the old craters and stretching down to the sea in stripes alternately wide and narrow in regular sequence, the wide of red, comparatively fine débris, the narrow of coarser fragments of black rock. Neither water nor wind action could account for these remarkable stone streams.

During the three hours on shore, large collections of every kind were made. Fifteen flowering plants were found, three times the number of species formerly known from the Crozets, though all are of species already known from Kerguelen or other islands of the South Indian Ocean. The fauna was found very rich in insects and spiders, several of the species not yet identified being apparently unknown in Kerguelen.

The voyage to Kerguelen continued until January 2, 1902, when the *Gauss* anchored in Observatory Bay, where the land party, who had arrived from Australia some months before, were waiting somewhat uncomfortably. The ship that had brought them had not been able to remain, and her Chinese crew had been such worthless workmen that the labour of installing the land station had been left for the crew of the *Gauss*, who had also to take on board the coal, stores and dogs that had been left for them. Much time was necessarily consumed in this work, everything having to be carried by hand to the boats and rowed out to the ship. About 130 tons of coal had to be left behind, the *Gauss* being full up with 400 tons.

The *Gauss* sailed on January 31 for her destination in the Antarctic with provisions for nearly three years on board. Prof. von Drygalski proposed to visit and if possible land on Heard Island, and then make straight for Wilkes' Termination Island, sailing along the ice towards the west so as to have the prevailing easterly winds of high southern latitudes in his favour, and ultimately turning southward and entering the ice. All on board were full of enthusiasm and confidence, satisfied with the ship, pleased with her equipment and determined to stay in the far south as long as they possibly could. The leader warns his friends not to suppose he is lost if pieces of wreckage from the *Gauss* should be discovered at sea, for she is very likely to lose some of her gear. He thinks

it possible he may be able to send news home by June, 1903, but the expedition is planned for two summers in the ice, and no news will be good news until June, 1904.

Dr. Bidlingmaier appends a summary of the meteorological conditions of the whole voyage out from Hamburg to Kerguelen. There are two maps and several illustrations.

MR. CHAMBERLAIN ON EDUCATION.

MR. CHAMBERLAIN visited University College School on Wednesday, November 5, to unveil a memorial tablet to old boys who have fallen in the war, and was afterwards presented with an address from the students of University College. The address, read by the president of the Students' Union Society, referred to the keen support of higher education shown by the Colonial Secretary in his interest in the foundation of the University of Birmingham. We quote the following from the report of Mr. Chamberlain's reply in the *Times* :—

I thank you very cordially for the warmth of your reception. I appreciate the kindness which led you to offer to me this address. I have, as the address states, a very great interest in the higher education of the country. Thirty years ago some of us in Birmingham were prominent in securing for all the children of the country an efficient primary education. We thought it was right that, whatever might be the social position of any child born in this land, he ought to have, as it were, the tools put into his hands in order to carve out a career for himself. That, I believe, was a great and important work. As you know, the Government of which I am a member is now, at this very moment, engaged in the endeavour to develop it. But it left untouched a work which, perhaps, from one point of view, at any rate, is of even greater importance—that is the work of secondary and higher education. It is not everyone who can, by any possibility, go forward into the higher spheres of education; but it is from those who do that we have to look for the men who, in the future, will carry high the flag of this country in commercial, scientific and economic competition with other nations. At the present moment I believe there is nothing more important than to supply the deficiencies which separate us from those with whom we are in the closest competition. In Germany, in America, in our own colony of Canada and in Australia, the higher education of the people has more support from the Government, is carried further than it is here in the old country; and the result is that in every profession, in every industry, you find the places taken by men and by women who have had a University education. And I would like to see the time in this country when no man should have a chance for any occupation of the better kind either in our factories, our workshops or our counting-houses who could not show proof that, in the course of his University career, he had deserved the position that was offered to him. What is it that makes a country? Of course you may say, and you would be quite right, the general qualities of the people, their resolution, their intelligence, their pertinacity, and many other good qualities. Yes; but that is not all, and it is not the main creative feature of a great nation. The greatness of a nation is made by its greatest men. It is those we want to educate. It is to those who are able to go, it may be, from the very lowest steps in the ladder, to men who are able to devote their time to higher education, that we have to look to continue the position which we now occupy as, at all events, one of the greatest nations on the face of the earth. And, feeling as I do on these subjects, you will not be surprised if I say that I cordially agree with what is said in this address. I think the time is coming when Governments will give more attention to this matter, and perhaps find a little more money to forward its interests. When we are spending, as we are, many millions—I think it is 13,000,000/—a year on primary education, it certainly seems as if we might add a little more, even a few tens of thousands, to what we give to University and secondary education.